

Appl. No. 10/803,178
Am't. dated July 31, 2006
Reply to Office Action of May 16, 2006

Atty. Ref. 81754.0114
Customer No. 26021

Remarks/Arguments

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Reconsideration of this application is requested.

Claim Status

Claims 2-8 and 10-14 are pending. Claims 2, 3, 10 and 11 are amended.

Claim Rejections

Claims 2-6 and 10-14 are rejected under 35 USC 103(a) as obvious over Narizuka (US 6,756,688) in view of Hsuan (US 6,166,444). Claims 7 and 8 are rejected as obvious over Narizuka in view of Hsuan and Farnworth (US 6,767,817). In response, independent claims 2, 3, 10 and 11 are amended to clearly distinguish over the references of record.

The present invention is directed to a semiconductor device (for example, FIG. 3) wherein a pad 16 is electrically connected to an integrated circuit 12. Wiring layer 20 has a concave portion 26 formed therein and is electrically connected to pad 16. External terminal 28 is joined directly to concave portion 26 of wiring layer 20 without any intervening layers. Resin layer 22 is provided with through hole 24 and is disposed on wiring layer 20. Through hole 24 and concave portion 26 reside at the same position wherein a width of the concave portion increases with a depth of the concave portion (claims 2 and 10).

The Action asserts that Narizuka discloses a concave portion within the wiring layer 13 (FIG. 3e). However, applicant's concave portion 26 is produced by etching techniques (see paragraph [0041]) that create a concave surface for solder 28 to bond with wiring layer 20, wherein the concave portion 26 is composed entirely of solder 28. In contrast, Narizuka's concave portion is not created by etching techniques but instead is caused by solder reflow into wiring 13. This difference is readily apparent by comparison of applicant's Figs. 7-8 with Narizuka's Figs. 3(d)-(e). Hsuan and Farnworth do not remedy the deficiencies of Narizuka in this regard.

In order to emphasize this difference, independent claims 2, 3, 10 and 11 are amended to recite an *etched* concave portion in the wiring layer. Since this

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limitation is not disclosed or suggested by Narizuka, Hsuan or Farnworth, claims 2, 3, 10 and 11, and claims 4-9 and 12-14 dependent thereon, are not obvious over Narizuka, Hsuan and Farnworth. The rejections under 35 USC 103(a) should be withdrawn.

Conclusion

This application is now in condition for allowance. The Examiner is invited to telephone the undersigned to resolve any issues that remain after entry of this amendment. Any fees due with this response, including extra claims fees, may be charged to our Deposit Account No. 50-1814.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

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By: 
Troy M. Schmelzer
Registration No. 36,667
Attorney for Applicant(s)

500 South Grand Avenue, Suite 1900
Los Angeles, California 90071
Phone: 213-337-6700
Fax: 213-337-6701